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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/691,135	10/21/2003	Jiun Hann Sir	42P17197	4962

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EXAMINER

PHAN, THIEM D

ART UNIT	PAPER NUMBER
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3729

DATE MAILED: 03/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)	
	10/691,135	SIR ET AL.	
	Examiner	Art Unit	
	Tim Phan	3729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 October 2003.
 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
 4a) Of the above claim(s) 1-21 is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 22-25 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. <u>3/2/05</u> |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-12 and 22-25, drawn to a method of making an interconnecting via, classified in class 29, subclass 852;
- II. Claims 13-21, drawn to a device, classified in class 428, subclass 209.

2. The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by using chemical etching, then injecting a conductive paste into the via holes. The process as claimed can be used to make a different product such as a sculpture.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

3. During a telephone conversation by Examiner Cathy Lam with Michael Bernadicou on 8/10/04 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-12 and 22-25.

However the Restriction should have restricted the methods further as shown hereinbelow. Hence a second Restriction is necessary.

4. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I-A. Claims 1-12, drawn to a method of making an interlocking interconnection, classified in class 29, subclass 852;

I-B. Claims 22-25, drawn to a method of making a conductive via, classified in class 29, subclass 846.

5. The inventions are distinct, each from the other because of the following reasons:

Inventions I-B and I-A are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the method of making a via as recited in Group I-B does not require an anchor volume with a width that is wider than the hole through the bottom conductor, as required by

Group I-A. The subcombination, Invention I-A, has separate utility such as utilizing the removed portion of the dielectric layer for anchor-interlocking.

6. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group I-A is not required for Group I-B, restriction for examination purposes as indicated is proper.

7. During a telephone conversation with Michael Bernadicou on 3/2/05 a provisional election was made with traverse to prosecute the invention of Group I-B, claims 22-25.

Affirmation of this election must be made by applicants in replying to this Office action.

Claim 1-21 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicants are advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR

1.143).

Applicants are reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

An Office Action on the merits of Claims 22-25 now follows.

Title

8. The following title is suggested: "Method of forming a Via".

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

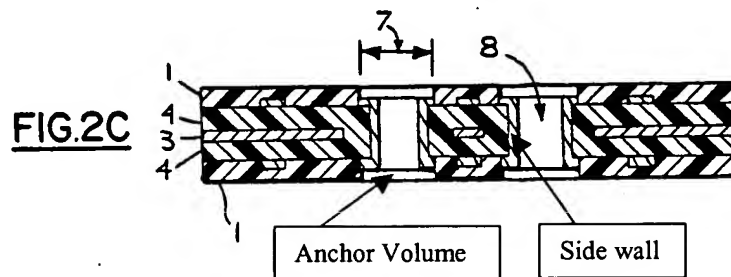
10. Claims 22-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Bindra et al (US 5,129,142) hereinafter '142.

As applied to claim 22, the '142 teaches a method of making high density circuit board, comprising:

- forming a first dielectric layer through lamination (Cf. Fig. 2B, bottom 1 & 4; col. 5, line 25);
- forming a bottom conductor (Cf. Fig. 2B, 3) on the first dielectric layer;
- forming a second dielectric layer (Cf. Fig. 2B, top 1 & 4) on the bottom conductor;
- removing a section of the second dielectric layer (Cf. Fig. 2c, bottom 1) to form a well (Cf. Fig. 2C, 8);
- removing a section of the bottom conductor (Cf. Fig. 2C, 3) to result in a via hole (Cf. Fig. 2C, 8);
- depositing a conductive material to form a top conductor (Cf. Fig. 3B, top 2) on the second dielectric layer (Cf. Fig. 3B, 1); and
- depositing a conductive material (Cf. Fig. 3B, 2) in the well and the via hole (Cf. Fig. 2C, 8) to electrically connect the top conductor (Cf. Fig. 3B, top 2) with the bottom conductor (Cf. Fig. 2B, 3), well known in the printed circuit board to be connected or not to a through-hole circuitry (Cf. Fig. 2C, 8).

As applied to claim 23, the '100 teaches that the via hole (Cf. Fig. 7, 13) extends all the way through the bottom conductor (Cf. Fig. 7, 21).

As applied to claim 24, the '100 teaches that the etching the second dielectric layer (Cf. Fig. 2C, bottom 1) results in a volume under the bottom conductor (Cf. Fig. 2C, 3), wherein the volume has at least one overlap section that extends beyond a side wall (Cf. Fig. 2C, see below) of the via hole (Cf. Fig. 2C, 8).



As applied to claim 25, the '100 teaches that the volume under the bottom conductor (Cf. Fig. 3B, 3) is an anchor volume (Cf. Fig. 2C, see above) and wherein depositing a conductive material in the well and the via hole to electrically connect the top conductor (Cf. Fig. 3B, top 2) with the bottom conductor further comprises depositing the conductive material (Cf. Fig. 3B, 2) to substantially fill the anchor volume.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tim Phan whose telephone number is 571-272-4568. The examiner can normally be reached on M - F, 9AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 571-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tim Phan
Examiner
Art Unit 3729


CARL J. ARBES
PRIMARY EXAMINER

tp
March 3, 2005